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ABSTRACT

The preference of the infant for mother versus father as an attachment figure and as a secure base for exploration is examined in this study. Subjects were fifteen 15-month-old infants whose mothers were their primary caregiver. The Ainsworth Strange Situation procedure was modified to permit both parents' simultaneous presence during separation and reunion. Ainsworth's qualitative ratings of attachment and frequency measures of exploration were used. Results indicate that separation from mother inhibited exploration more significantly than separation from father and that mother was preferred to father on proximal attachment measures at reunion. The importance of viewing the attachment-exploration balance as an index of the affective and cognitive aspects of the child's developing personality is stressed, and implications for day care and academic achievement are mentioned. (Author/JA)

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The Attachment-Exploration Balance in Infancy: Mother or Father?

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THE ATTACHMENT-EXPLORATION BALANCE IN INFANCY: MOTHER OR FATHER?

In their seminal paper on infant attachment research, Sroufe and Waters (1977) emphasized the importance of having regard to the content and meaning of the child's attachment behavior. Together with Ainsworth and her collaborators (Ainsworth et al., 1978), they have secured the importance of the organizational approach to studying attachment in child development research. Ainsworth has furthermore emphasized that exploratory behavior should be related to the child's attachment to his/her mother and has accordingly formulated the now well-known concept of the "attachment-exploration balance" - the relative emphasis in the infant's behavior on exploratory versus attachment related behaviors and the importance of a secure relationship with a caretaking figure as a sine qua non for exploration.

Ainsworth's term "attachment-exploration balance" indicates the essential link between the affective and cognitive aspects of the development of the child. Time does not permit an exposition of the theoretical, empirical and clinical considerations which point to this link; however we stress its importance and its centrality to the research to be reported here.

This study explores the preference of the infant for mother versus father as an attachment figure and as a secure base for exploration. We hypothesized that infants whose mothers were the primary caretaker would organize their attachment and exploratory behavior preferentially around her presence more significantly than around the presence of the father or a stranger. We assumed that the infant's relationship to the mother as primary caretaker

would be more central to both its affective and cognitive development than that of either the father or a stranger such that the link between the affective and cognitive factors in development could be clearly demonstrated by assessing the attachment-exploration balance.

Previous studies of the infant's preference for mother versus father as attachment figure or secure base for exploration raise methodological and/or interpretative difficulties. With regard to exploratory behavior, Feldman and Ingham (1975) report no differential play inhibition of 12-month old subjects after separation from mother, father or an acquaintance; on the other hand Kotelchuck (1976) reports such inhibition after mother's but not father's departure for 12- and 18-month old children but not for 15-month olds. All of these studies employ a global "play" variable as an index of exploration, some also confound order effects and parental preference in the data analysis or assess play inhibition at different stages of the Strange Situation procedure for different subjects, thus ignoring the cumulative increase in stress which most episodes in the Strange Situation procedure are designed to induce (Ainsworth et al., 1978). We tried to eliminate this confounding by assessing the comparative impact of separation from mother versus father at the same juncture in the Strange Situation procedure for both parents. We also preferred Ainsworth's three-fold operationalization of exploratory behavior rather than a global "play" variable as an index of exploration.

Aside from parental preference in exploratory behavior, previous studies of infant-parent attachment do not provide the child with a simultaneous choice of mother or father in the experimental

situation and/or use exclusively frequency rather than the more reliable qualitative measures of attachment (Ainsworth et al., 1978; Sroufe and Waters, 1977). Lamb's pioneering work in this field deserves special mention: in his studies employing frequency measures of attachment, Lamb (e.g., 1977) did not utilize the Strange Situation, but employed a procedure which confounded reactions to reunion with a parent with reactions to seeing the stranger for the first time. The difficulty is that both stranger-related reactions and separation from parents usually cause an increase in attachment behavior (Ainsworth et al., 1978; cf. Lamb, 1977). On the other hand, although these studies measured the frequency of attachment behavior they were designed to provide the infant with the simultaneous choice of mother or father at reunion. In his subsequent study of the differential quality rather than frequency of infant-mother versus infant-father attachment, however, Lamb (1978) employed Ainsworth's Strange Situation but mother and father were not present simultaneously to provide a basis for comparing preference in the quality of infant-father versus infant-mother attachment. Although Lamb's study does suggest that the quality of the relationship to one parent sometimes predicts the quality of the relationship to the other, these results may reflect the child's need for security and comfort involving the known security figure then available rather than clarifying preferences in the organization of the quality of attachment to mother versus father.

Since the mother was the primary caretaker of all the infants in this study it was expected that the attachment-exploration balance would shift in favor of attachment more significantly when

the infants were separated from mother than during separation from father. Differences in reactions to separation from mother, father and stranger were expected to parallel previous research in showing the inability of the stranger to function adequately as a secure base in the Strange Situation, when compared to either parent.

Method and Procedure

Fifteen 15-month old infants (9 boys, and 6 girls) were selected from families volunteering to participate in research on the Infant Study Program of the Child Analytic Study Program, Children's Psychiatric Hospital, University of Michigan. Families were recruited by letter and the final sample was screened according to the research design criteria adopted (mother as primary caretaker, normal medical history, native U.S. born subject, number of same sex children already participating). Ten of the 15 families were from the major business/professional class, 4 from the medium business/minor professional class and 1 from the skilled and semi-skilled worker class, all assessed according to Hollingshead's Four Factor Index of Social Position (Hollingshead, 1975).

Ainsworth's Strange Situation procedure was followed except for the inclusion of one additional episode allowing for separation from both parents sequentially and also providing for the simultaneous presence of both parents during reunion episodes (Table I). A unit incorporating a one-way mirror flanked by two doors was specially constructed and used as a room divider, thus allowing both parents to re-enter the observation area of the room simultaneously to provide the child with a simultaneous choice of parents during reunion (Figure I). The order in which the parents

left the child first at the end of episode 3 was varied systematically such that father separated first for about half the sample (9), mother for the other half (6). Seating of the parents was also alternated systematically.

Ainsworth's frequency measures of exploration (exploratory locomotion, exploratory manipulation, and visual exploration) and qualitative ratings of attachment behaviors (proximity-seeking, contact-maintaining, resistance, avoidance, search and distance interaction) were applied by two independent judges to videotaped observations of Strange Situation behavior. Interjudge agreement for exploratory locomotion was 89%, for exploratory manipulation 94% and for visual exploration 92%. Interjudge differences in the behavioral ratings of the quality of attachment were resolved in conference.

It should be noted that this study does not utilize Ainsworth's qualitative ratings of infant-parent attachment to classify infants into groups, based on the security of their attachment. The purpose of the present study was to assess infant-parent preference in attachment and exploratory behavior utilizing Ainsworth's qualitative ratings which, like the classifications of security of attachment, have been found to be significantly more stable than frequency measures of attachment (Waters, 1978). A "between episodes" analysis of differentiality and preference in exploratory and attachment behavior in relation to mother, father and stranger was usually conducted by the Wilcoxon Signed-Ranks Matched Pairs Test; differences within episodes were assessed by the Mann-Whitney U Test.

Results

Exploration

Figure II shows the levels of the three exploratory behaviors according to whether the mother or father left first at the end of episode 3. The data for episodes 2 and 3 are based on the whole group since no significant differences emerged between the "mother leaves first" and "father leaves first" groups before episode 4.

All subjects explored significantly less after the stranger entered than before, boys significantly more so than girls (exploratory manipulation - boys: Sign test, $p=.03$; girls: Sign test, $p=.37$; visual exploration: boys, $T=10$, $p=.03$; girls, $T=11$, $p=.5$). Compared with preseparation levels (episode 3), exploratory locomotion was significantly lower when mother left first than father (mother, $T=8$, $p=.04$; father, $T=11$, $p=.3$). There was a nonsignificant tendency for exploratory manipulation and visual exploration to increase after father's exit but to decrease after the mother left first. Exploratory manipulation and visual exploration within episode 4, however, were also significantly lower for those children separated from the mother first at the end of episode 3 than from the father (exploratory manipulation: $U=12$, $p=.02$; visual exploration: $U=12.5$, $p=.02$). Girls were significantly lower than boys on exploratory manipulation when mother but not father left first ($U=0$, $p=.05$) and boys were significantly lower than girls in visual exploration in the same circumstances ($U=3$, $p=.03$). With regard to the stranger's function as a secure base, all infants showed significantly less exploratory manipulation when alone with the stranger than when together with mother, father and stranger ($T=21$, $p=.01$ - episode 3 vs. episode 5) and there was

significantly more exploratory manipulation in the presence of one parent and the stranger than when the child was left alone with the stranger (T=21, p=.02 - episode 4 vs. episode 5). When alone with the stranger in episode 5, those children who had been separated first from the mother at the end of episode 3 showed significantly less exploratory manipulation than those who had been separated from the father first (U=12, p=.05). Compared to preseparation levels, all subjects exhibited significantly less visual exploration (T=29, p=.03) and exploratory manipulation (T=16, p=.005) during the first reunion - episode 2 vs. episode 6. Girls showed this tendency in exploratory manipulation significantly (T=0, p=.005) while boys did not. At second reunion however, all three exploratory behaviors were significantly depressed and no sex differences emerged (exploratory locomotion: T=26.5, p=.03; exploratory manipulation: T=0, p=.007; visual exploration: T=15, p=.005 - episode 2 vs. episode 9).

Attachment

Some of our results parallel those reported by others in infant-mother attachment studies (cf. Ainsworth et al., 1978): at no time was the stranger preferred as an attachment figure to either parent. Once the stranger entered the room (episode 3) there was greater avoidance of (T=36, $p<.05$ - for both parents) but greater distance interaction (mother: Sign test $p<.01$; father: Sign test $p<.0002$) with the stranger than with either mother or father, suggesting an ambivalent curiosity towards the stranger. Boys were especially affected in this way (avoidance: Sign test $p<.01$; distance interaction: Sign test $p<.007$). However, monitoring the shift in attachment behavior from pre- to post-stranger entry (episode 2 vs. episode 3) the infants as a whole and the boys in particular showed greater proximity-seeking behavior to both mother and father (all subjects - mother: T=6, $p<.005$; father: T=3, $p<.005$. Boys - mother: T=6,

$p < .01$; father: $T=3$, $p < .005$).

Fear-wariness, attachment and curiosity (cf. Bretherton and Ainsworth, 1974) seem evident in these stranger reactions. However using Ainsworth's quantitative measure of visual regard, the infants displayed greater visual exploration of the room than visual interest in any of the adults (looking at mother or father: $T=136$, $p < .0004$; stranger: $T=112.5$, $p < .002$) and greater visual interest in and distance interaction with the stranger than either of the parents (looking/distance interaction with mother: $T=120$, $p < .0007$/Sign test, $p < .01$; looking/distance interaction with father: $T=136$, $p < .0004$/ Sign test, $p < .0002$). The stranger's entry clearly heightened attachment behavior but as has been noted by others (e.g., Ainsworth et al., 1978) was mixed with significant curiosity and did not inhibit visual exploration of the room.

The infants separated first from the mother tended to seek proximity to the father more than to the stranger after the mother's departure (Median test, $p=.06$, $\bar{X}_{Prox.\ F}=3.1$; $\bar{X}_{Prox.\ S}=1.0$). These results were significant also only for the boys ($T=0$, $p < .01$). There was no significant difference in the proximity-seeking behavior towards mother versus stranger of infants separated first from the father ($\bar{X}_{Prox.\ M}=2.0$; $\bar{X}_{Prox.\ S}=1.6$). These results parallel exactly the differential decrease in exploration after the mother's departure but not father's. No measure of attachment differentiated mother from stranger after father left but there was greater proximity to father than stranger after mother left. We also used Ainsworth's "search" variable and found that children left alone with the stranger and a parent searched for the departed opposite-sex parent significantly more intensely than for the same-sex parent during sequential separation ($U=15.5$, $p \leq .05$, one-tailed). These results

are similar to those reported by Weinraub and Frankel (1977).

Although the effect of separation and reunion on attachment reached statistical significance only at second reunion (episode 9), Figure III shows more proximity-seeking to mother in both groups of infants at first reunion (episode 6) with the least being displayed to the father who stayed with the infant in episode 4. This pattern was accentuated at the second reunion: infants separated from mother first sought proximity to mother significantly more than to father in episode 9 ($T=1$, $p \leq .02$). There was no difference in proximity-seeking to mother or father for infants separated first from father after episode 3. The infants as a group also evidenced significantly greater proximity-seeking ($T=24.5$, $p < .04$) and also resistance to mother than to father ($T=6.5$, $p < .005$). Their distance interaction with father was also more intense than with mother ($T=8.5$, $p < .005$).

Discussion and Conclusions

The attachment-exploration balance in infants with mother as the primary caretaker seems more significantly affected by separation from her than from father. This is manifested primarily through the organization of exploration and proximity-seeking behavior in the context of repeated separation and reunions from both parents available simultaneously (cf. Tracy et al., 1976). This study suggests the mother's greater importance as a secure base for exploration and attachment than the father. The stranger provided neither a secure base for exploration nor an adequate alternative attachment presence. Separation from the mother lowered exploration and heightened proximity-seeking to the father; reunion with the mother, although the father was simultaneously available, increased

proximity-seeking behavior to her more than to father especially for infants separated first from mother (Figure IV). The resistance accompanying increased proximity-seeking to mother is probably an indication of underlying anger at the separation, but it is not clear whether this should be considered a sign of possible early pathology as is suggested by Ainsworth's C-classification or whether the presence of the father facilitated the expression of anger towards the mother at reunion. Clearly further research is needed and the trends in this study are suggestive only being based on a small sample.

The implications of this research for child care are that separation from the primary caretaking figure (mother) once an attachment has been formed may have at least short-term disruptive effects on exploration, although available evidence from other studies on the impact of day care does not clearly establish that there are no negative effects on attachment. If the father cannot be an equal substitute for mother as a secure base or attachment figure, what conditions are needed to make it possible for an alternative caretaker to do so? Assuming that early interest in exploration is an important ingredient in cognitive development and influences subsequent school achievement, future research should assess the effect of early separations and emotional development in general over the longer term on cognitive development in children in both traditional and nontraditional child care settings. There is growing clinical recognition of the relationship between separation and childhood depression on the one hand, and distractibility and concentration difficulties in school on the other - especially in the middle childhood years. Children who are

distractible and have concentration difficulties are often thought of as hyperkinetic (the organic syndrome) whereas recent studies suggest that they quite often have an earlier history of separation; the hyperactivity they manifest seems better described as "hyper-anxiety" which together with other factors, could be indicative of a childhood depression rather than an organic condition (Freeman and Cornwall, 1980). It is essential to clarify this link between cognitive development and the child's emotional history - the basis of this link seems to lie, at least in part, in the attachment-exploration balance.

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Number of Episode	Persons Present	Duration	Brief Description of Action
1	Mother, Father, Baby, Experimenter	30 secs.	Experimenter introduces mother, father and baby to the experimental room, then leaves.
2	Mother, Father, Baby	3 mins.	Parents watch baby explore; if necessary, play is stimulated after 2 minutes.
3	Mother, Father, Baby and Stranger	3 mins.	Stranger enters. First minute: stranger silent. Second minute: stranger converses with parents. Third minute: stranger approaches baby. After 3 minutes one parent leaves unobtrusively.
4	Mother or Father, Baby and Stranger	3 mins.	Remaining parent responds only if baby initiates. May comfort baby and then settle him again in play. After 3 minutes; other parent leaves unobtrusively.
5	Stranger, and Baby	3 mins. or less	First separation episode. Stranger's behavior is geared to that of baby.
6	Mother, Father, Baby	3 mins. or more	First reunion episode. Parents greet and/or comfort baby, then settle him again in play. Parents then leave together, saying "bye-bye." Stranger leaves unobtrusively.
7	Baby alone	3 mins. or less	Second separation episode.
8	Stranger, and Baby	3 mins. or less	Continuation of second separation. Stranger enters and gears her behavior to that of baby.
9	Mother, Father, and Baby	3 mins.	Second reunion episode. Parents enter simultaneously, greet baby, baby may be comforted or cuddled by parent of his preference. Stranger leaves unobtrusively.

Table I 16

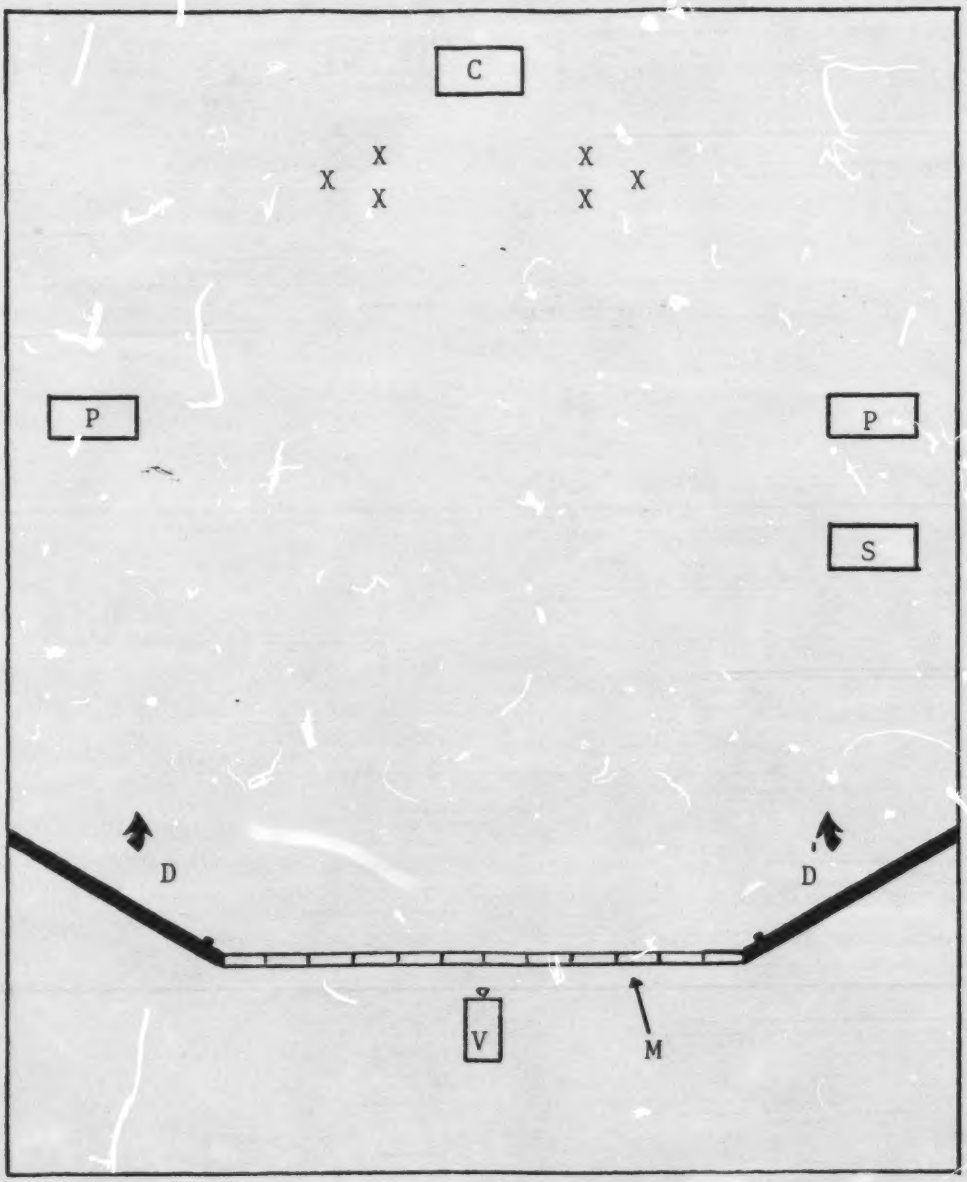

Figure I

C = Child
P = Parent
S = Stranger
V = Videocamera
M = One-way Mirror
X = Toys
D = Door

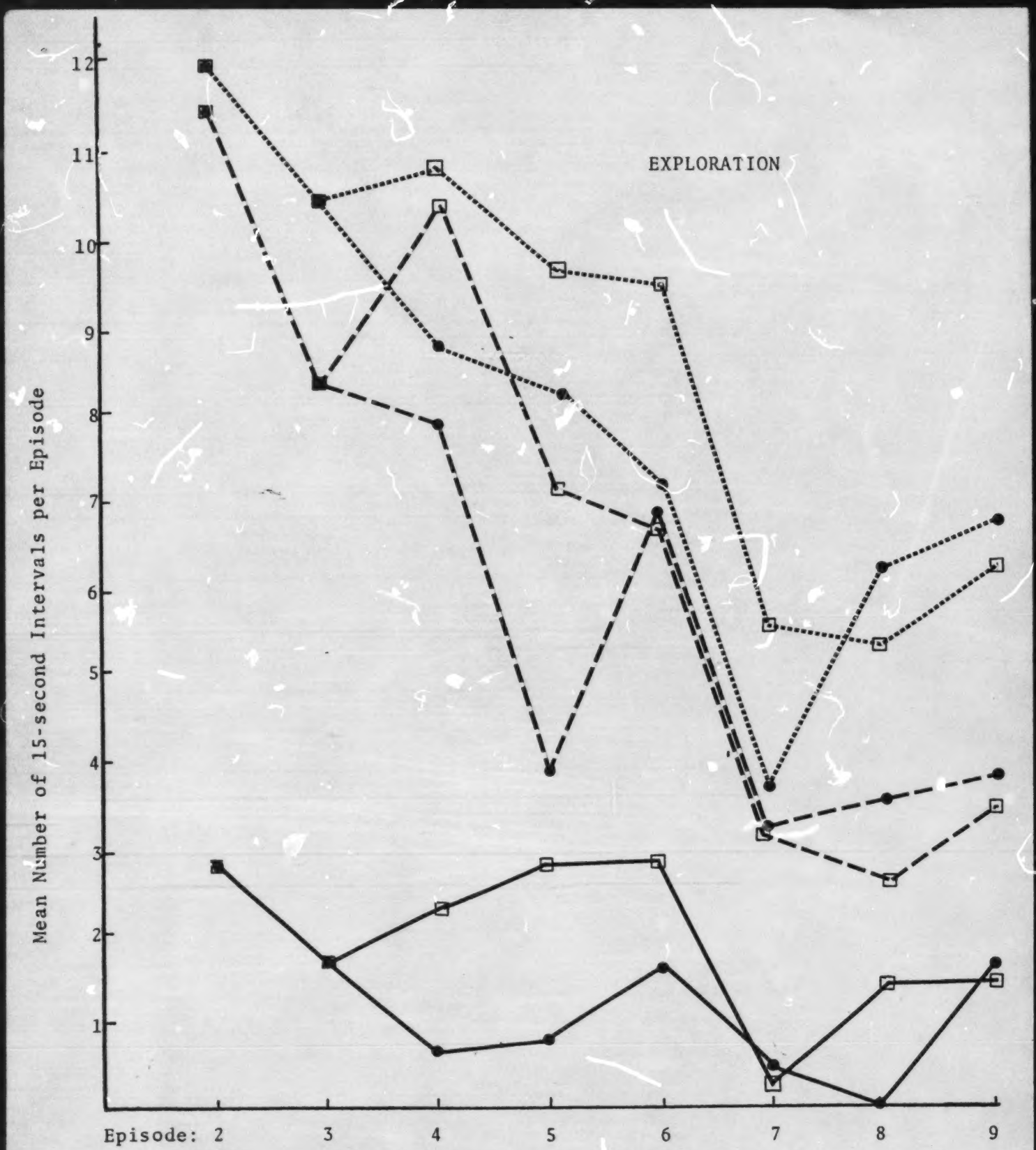

Figure II

● = Father stays (n=6)

□ = Mother stays (n=9)

——— Exploratory locomotion

– – – Exploratory manipulation

..... Visual exploration

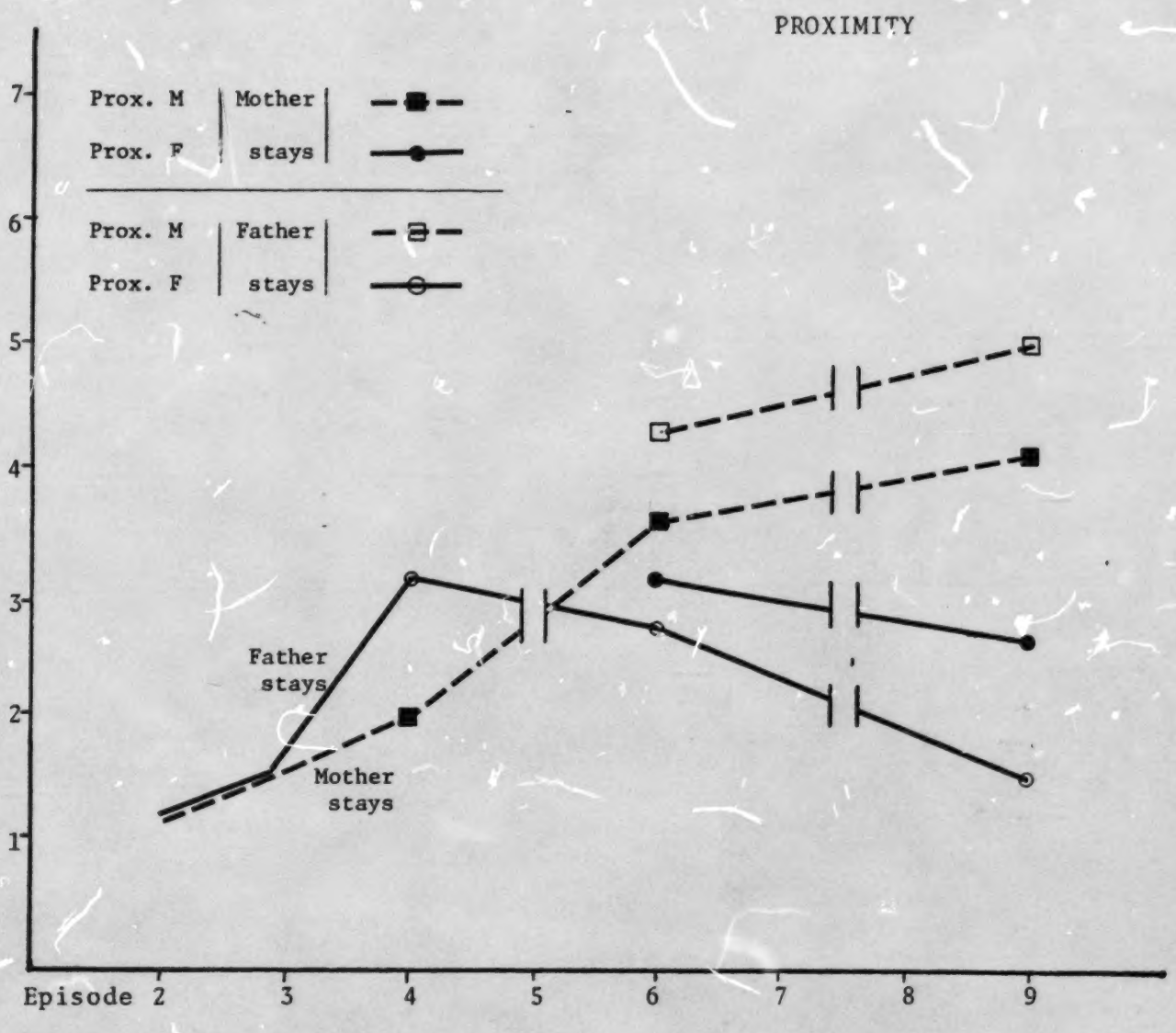
PROXIMITY
Prox. M
Prox. F
Mother
stays
Prox. M
Prox. F
Father
stays
7
6
5
4
3
2
1
Father
stays
Mother
stays
Episode 2
3
4
5
6
7
8
9

Figure III

THE ATTACHMENT-EXPLORATION BALANCE

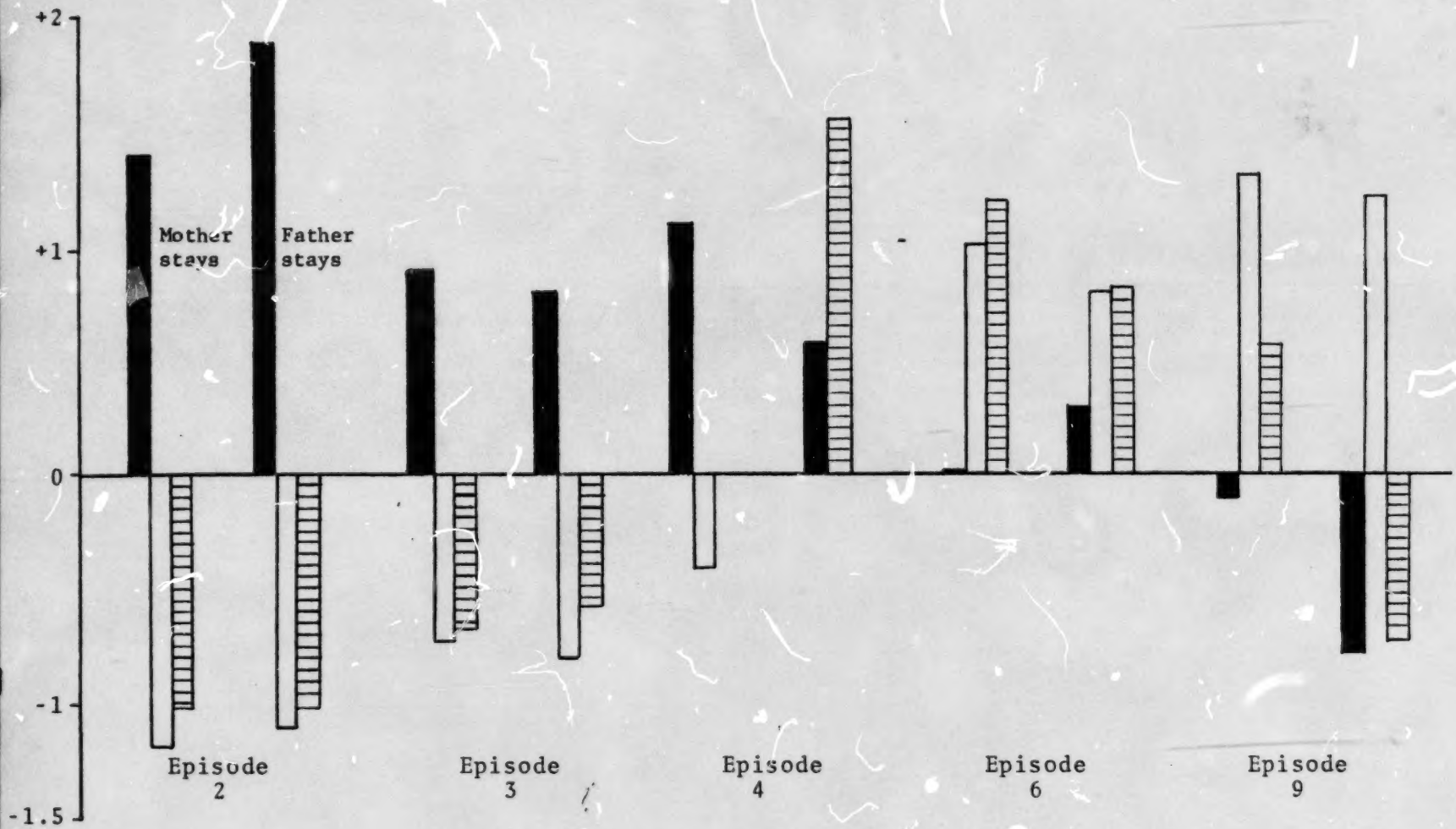

Figure IV